

# SUSTRUS

## Results from a sustainability model for Russia

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## Overview

- Sustainable Russia or SUSTRUS
- Overview of project results
- Conclusions

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## Sustainable Russia

Dimension	Advantages to sustainability	Threats to sustainability
Energy / Environment	Abundant natural resources	Low energy efficiency
Demographics / Social development	Highly educated labour force	Unfavorable demographic situation
Institutions / History	Improvements in institutional development	Inheritance of Soviet regime
Economic development / Social cohesion	High growth potential	Increasing income inequality
Economic development / International market	Diversification of economy	Export dependency

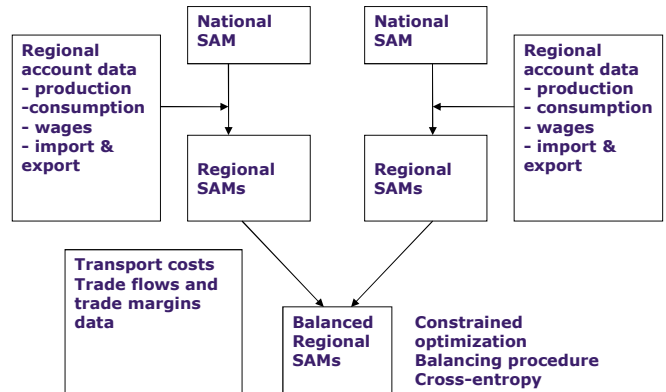
## “Modelling... the Sustrus way”

Dimension	Characteristics
Production sector	32 sectors based on NACE classification
Households	Low, middle and high incomes
Regions	Russian Federations (7 regions)
Foreign sector	Disaggregated results by country
Transport & trade sector	Interregional and international transport costs and margins
Market structure	Allows for both perfect competition and imperfect competition
Government	Federal versus regional government
Model structure	Based mainly on RAEM model and GEM-E-3
Dynamics	Static and dynamic version of the model

## Model database

Data	Source
Input-Output table	Based on GTAP recalibrated (CEFIR)
Regional production by sector	Goskomstat / Rosstat
Interregional trade flows	CEFIR calculations
Trade margins on products	EXIOPOLL database (TNO)
Labour market / social data	ILO database / RLMS survey
International trade	GTAP 7
National account data	Russian central bank & Goskomstat

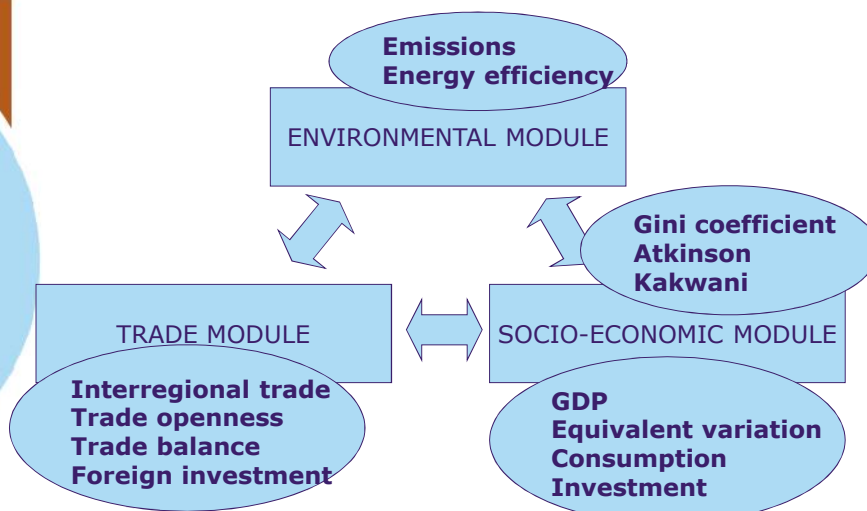
## Calibration



$$\nabla = \sum_i p_i \cdot \log \frac{p_i}{g_i}$$

Consistency check = Are trade flows and calculated margins correct and consistent with historical data

## Interrelated objectives



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## Application 1: Environment

Topic	Environmental concerns
Policy relevance	ETS accession Russia Increasing energy efficiency in Russia Economic diversification
Simulation	Emission tax of 38 rubles (+- 1 euro) / ton on carbon dioxide Static run
Assumptions	Government saves tax revenues Monopolistic competition Flexible foreign savings
Impacts	Reduction in energy consumption Reduction in production (GDP) Welfare effect Secondary effects on inequality

ENVIRONMENT		%	ECONOMY		%	SOCIAL		%
CO2 emissions	-4.56		GDP Capita	-0.23	Unemployment	0.63		
Electricity	-0.65		Investment	0.71	Welfare	-0.17		
Fossil fuels	-0.89		Public Savings	1.05	Welfare QL	-0.19		
NOX emissions	-6.14		Tax revenues	0.58	Welfare QM	-0.18		
PM emissions	-4.46				Welfare QH	-0.17		
SOX emissions	-3.66		TRADE					
			Trade Balance	0.40				
			Foreign Invest	0.23				
			Trade Integr	-0.09				
			Trade Open	0.13				


	Welfare	GDP	Tax revenues	CO2	Shadow price CO2 (rubles/ ton)	
Unit	(billion rubles)	(billion rubles)	(billion rubles)	(Mega ton)	Welfare	GDP
Totals	-32.76	-60.68	34.85	-76.48	428.37	793.35


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## Application 2: Social

Topic	Social indicators
Policy relevance	Taxation and redistribution of income Test of social indicators
Simulation	Differential taxation of low, medium and high income households 10% increase in tax rate of low, medium and high income households
Assumptions	Government saves tax income Adjustment in foreign savings to balance international market
Impacts	Inequality indices react to progressive or regressive taxation


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<b>SOCIAL (% change)</b>	<b>Low</b>	<b>Medium</b>	<b>High</b>
Atkinson	3.09	0.63	-4.02
Consumption budget	-0.33	-0.65	-1.51
Gini	0.00	-0.02	-0.06
Kakwani	-110.91	-61.91	177.28
Poverty Intensity	-0.01	-0.02	-0.05
Welfare	-0.21	-0.42	-0.95
Welfare QL	-1.69	0.02	0.04
Welfare QM	0.01	-1.69	0.05
Welfare QH	0.01	0.03	-1.59

<b>ECONOMY (% change)</b>	<b>Low</b>	<b>Medium</b>	<b>High</b>
GDPcapitaReal	-0.04	-0.08	-0.17
Herfindahl	-0.01	-0.01	-0.04
Investment	-0.10	-0.16	-0.29
Price Index	-0.07	-0.14	-0.33
Public Savings	0.04	0.08	0.17
Tax Revenues	0.40	0.79	1.85
<b>TRADE (% change)</b>			
Foreign Invest	0.04	0.08	0.17
Current Account	0.37	1.02	1.22
Regional trade	-0.06	-0.10	-0.18
Trade Openness	-0.02	-0.08	-0.02

## Application 3: WTO accession

Topic	International market
Policy relevance	WTO accession Russian Federation
Simulation	Introduction of tariff cuts on import tax Reform of FDI in service sector 2012 (short term) 2015 (long term)
Assumptions	Government reduces consumption to balance budget International closure via foreign savings adjustment Capital mobility between regions/sectors
Impacts	Reduction in real market prices Domestic investment and output adjustment Secondary effects on inequality

## Tariff reform?

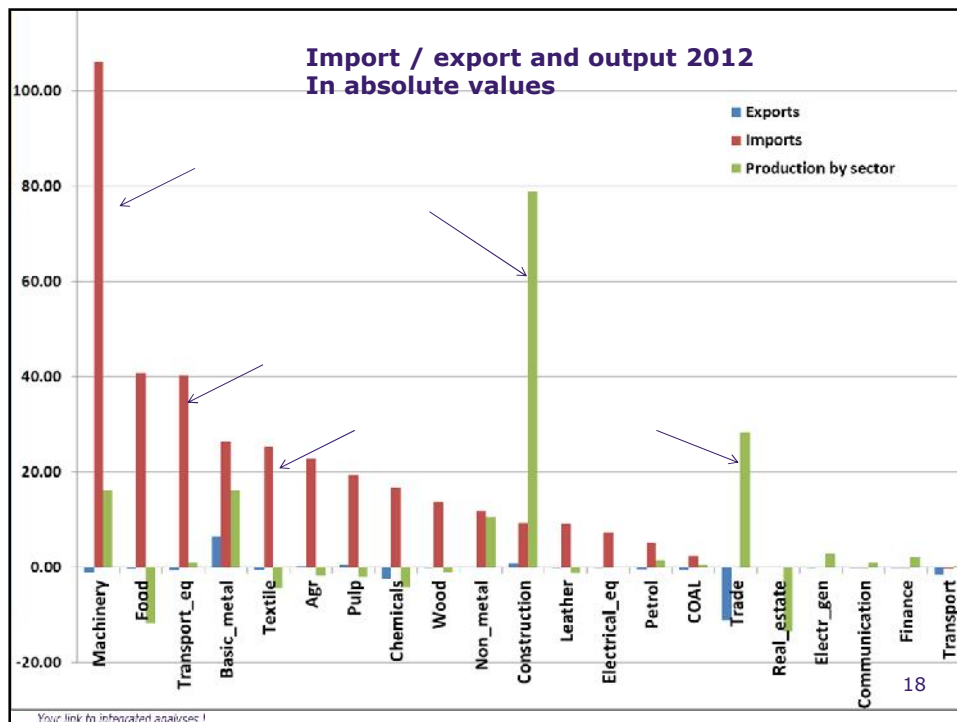
	Pre-WTO	WTO
Agriculture	13.2	10.8
Food products	15	12
Textiles and textile products	9.5	7.3
Leather and leather products	9.5	7.3
Wood and paper products	13.4	8
Petrol	5	5
Chemicals	6.5	5.2
Rubber and plastics	15	15
Non-metallic minerals	9.5	7.3
Basic metals	9.5	7.3
Machinery	8.4	6.2
Electrical and optical equipment	8.4	6.2
Transport equipment	15.5	12
Manufacturing n.e.c.	9.5	7.3

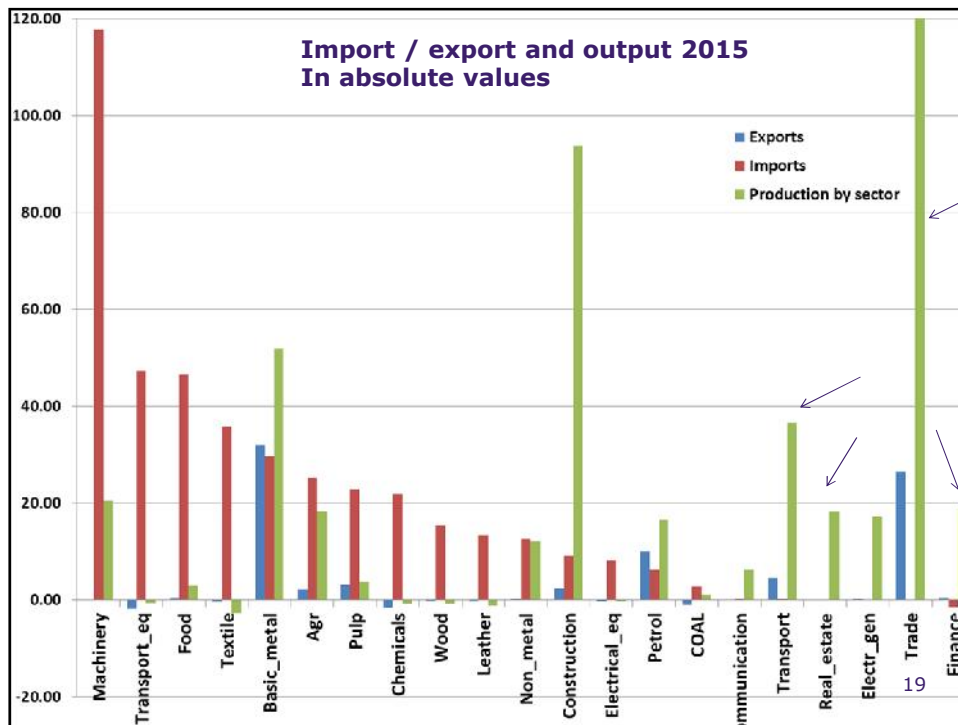
**+Service liberalization:  
-> 10% decrease  
in fixed cost for  
foreign  
establishment**

(ad valorem tax rates : source WTO 2011)

## Main effects

	Scenario	2012	2015
Welfare	Tariff reform	0.41%	0.96%
	Service reform	0.80%	1.38%
GDP	Tariff reform	-0.11%	0.75%
	Service reform	-0.12%	0.83%
Tax revenues	Tariff reform	-1.10%	-0.73%
	Service reform	-1.11%	-0.05%
Trade Balance	Tariff reform	-11.26%	-10.58%
	Service reform	-9.38%	-12.69%





## Inequality?

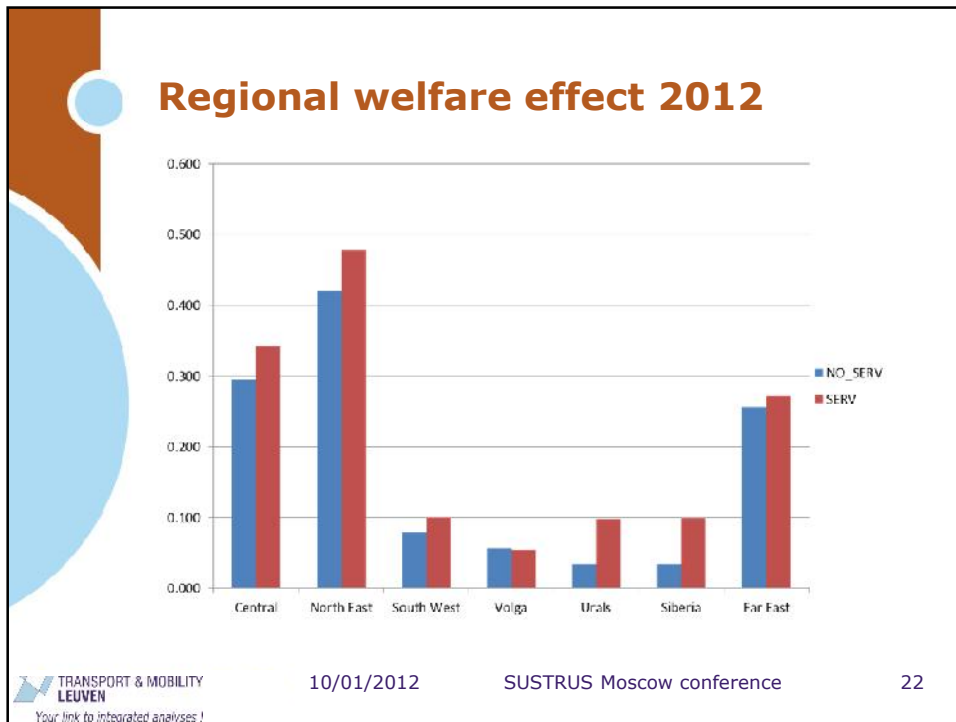
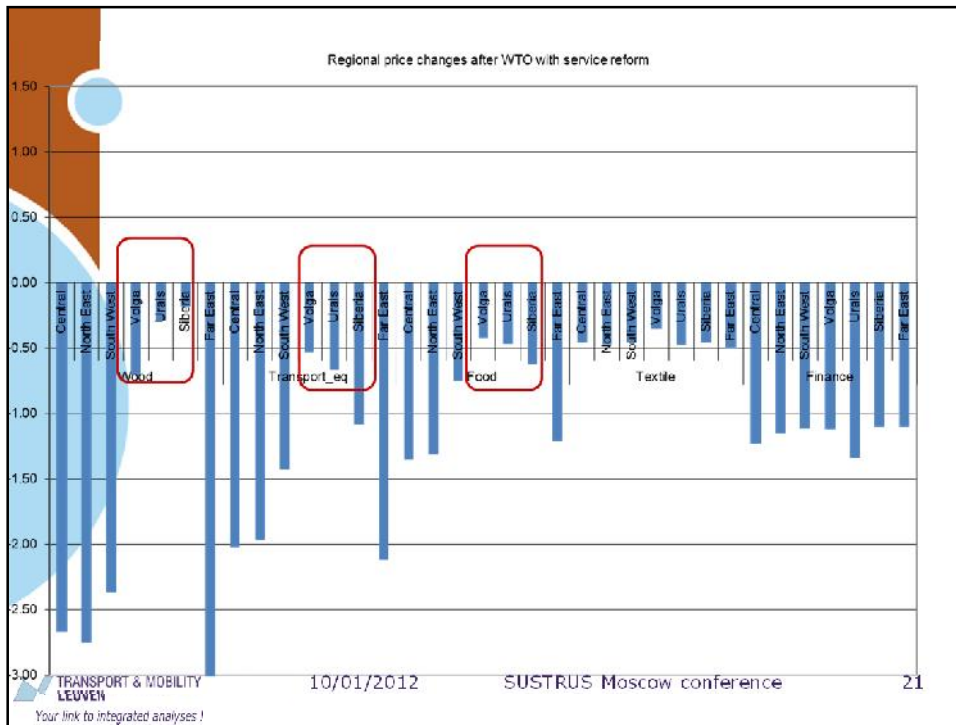
	2012		SERVICE REFORM	
			WITHOUT	WITH
Welfare			0.416%	0.809%
WelfareQL			0.480%	0.793%
WelfareQM			0.447%	0.808%
WelfareQH			0.389%	0.814%
	<b>2015</b>		<b>SERVICE REFORM</b>	
			<b>WITHOUT</b>	<b>WITH</b>
Welfare			0.96%	1.41%
WelfareQL			0.82%	1.17%
WelfareQM			0.94%	1.35%
WelfareQH			1.00%	1.48%
<i>Atkinson index</i>			<b>1.35%</b>	<b>1.73%</b>
<i>Gini indicator</i>			<b>0.13%</b>	<b>0.14%</b>

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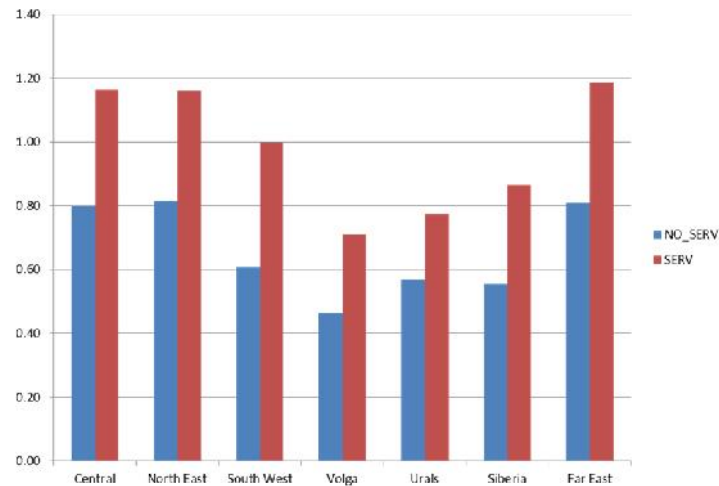
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## Regional welfare effect 2015



## Conclusions

- SUSTRUS is a novel general equilibrium model that allows for a balanced sustainability impact analysis
- Tests with the environmental model show that emissions of carbon dioxide and other pollutants can be reduced at relatively low cost and with the additional benefit of tax revenues
- As far as taxation and redistribution are issues, we stress the importance of transfers and the recycling of tax revenues to measure welfare effects
- A simulation of the WTO accession shows that the current reform leads to a modest improvement in welfare and output adjustment on long term.
- Welfare effects of WTO accession are dependent on the accessibility of the region. Central, North West and Far East region have the largest benefits



**Thank you  
For your attention**